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Erratum

Erratum to "Boolean neural nets are observable," [Theoret. Comput. Sci. 134 (1994) 51–61][1]

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The main result in [1] purporting to show that discrete dynamical systems defined by cellular automata and discrete neural nets have the shadowing property is *false*, i.e., the true behavior of their orbits cannot always be inferred to arbitrary precision by observing orbits corrupted by appropriately bounded noise. The gap has been traced to the last statement in the proof of Proposition 4.1, which is invalid. The i-toggleness at site k does not follow from the fact that the range of every pseudoblock D, $T(D)_{ik}$ has order p. In many cases the i-range is the whole state set Z_{p^2}.

However, the results of Section 3 and those in Section 4 up to Theorem 4.1 are correct. The new results claimed in the remaining Sections 4 and 5 are true only where the set of states is restricted to an abelian group with a *square-free number of states*. The proofs of the corrected results can be found in Section 9.4 of [2], which is essentially a revised version of the paper.

We would like to express our appreciation for Petr Kůrka for cautious remarks [3] and reference to [4] that led us to discover the errors reported herein. To give a complete characterization of exactly which maps of configuration space possess this property appears to be an interesting open and difficult problem indeed.

References

[1] F. Botelho, M. Garzon, Boolean neural nets are observable, Theoret. Comput. Sci. 134 (1994) 51–61
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[3] P. Kůrka, personal communication.
[4] R. Gilman, Classes of linear automata. Ergodic Theory Dyn. Systems 7 (1987) 108–118.

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[1]SSDI original article:

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